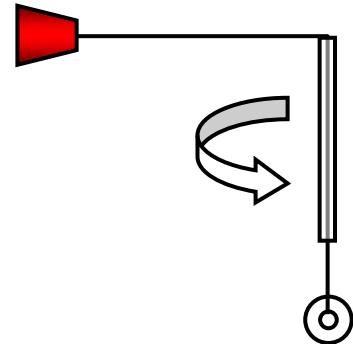


TAP 225- 3: Verification of the equation for centripetal force using a whirling bung

Requirements

- ✓ string (about 1m)
- ✓ rubber bung with a hole to tie the string
- ✓ short length of glass tube (e.g. 10 cm, the ends must be fire polished)
- ✓ 10 g masses or washers
- ✓ balance
- ✓ metre rule
- ✓ stop clock or stopwatch



Set-up:

Tie a piece of string (length about 1 m) to a rubber bung and then thread it through a short length (10 cm) of glass tube. Fix a small weight (such as a few washers with a mass a little greater than the mass of the bung) to the lower end of the string.

What to do:

- Whirl the bung round in a horizontal circle (radius approximately 80 cm) while holding the glass tube so that the radius of the bung's orbit is constant.

(A mark on the string will help you see if the radius of the orbit remains the same).

- Measure the mass of the bung (m), the radius of the orbit (R) and the time for ten orbits ($10 \times T$).
- Calculate the period of the orbit and then work out centripetal force (F). Compare this value with the weight of the washers.

(The centripetal force should be equal to the weight of the washers. This will only be the case if the system is frictionless.)

- Make a systematic study, (fair test), to determine how F depends on m , R and period T .



Wear safety spectacles

String can break and the bungs fly about.

